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Combat Crew

Strategic Air Command

JANUARY 1986

★★★★

Combat Crew

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ON OUR COVER

A B-52G at low level. To aid in this demanding mission, new paint jobs are in the works. For more on the new strategic camouflage scheme, turn to page four.

Goals for Excellence



General Larry D. Welch
Commander in Chief
Strategic Air Command

A little over two months from now, we will celebrate the 40th anniversary of the formation of Strategic Air Command. As we move forward in this new year, we carry with us the proud heritage of making the world a safer place by maintaining an effective nuclear deterrent for four decades. In Strategic Air Command that unwavering performance is absolutely essential. The nature of the world and the threat today means constant vigilance and constant readiness. It means operational crews in alert facilities and launch control centers 24 hours a day; it means maintenance and security crews on the flightline and at missile facilities 24 hours a day. The men and women of Strategic Air Command have done the job and compiled an outstanding record of accomplishment. Our ability to continue that record and maintain effective nuclear deterrence in the years ahead rests on three factors.

The first is the national will to pay the price of maintaining peace and freedom. While there are and will continue to be competing priorities and differing opinions about the details of what is needed to maintain freedom, there is a clear consensus among the American people in support of a strong national defense — a defense that prevents war by persuading potential adversaries that the costs of attacking us will exceed any gain they could hope to achieve.

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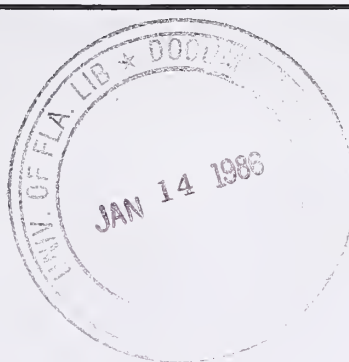
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The second factor is our continuing ability to exploit the technological advantage that comes from bright minds employed in a free enterprise system. We are properly much concerned about Soviet successes in stealing modern technology from the United States. However, that remains a poor substitute for their lack of ability to compete with a free society. Hence, we retain the technological edge. Our task is to translate the right technology into the right weapon systems at affordable costs, and that process is ongoing and succeeding.

The third factor is our most pressing daily business in Strategic Air Command — the human factor — engaging the bright, dedicated men and women of Strategic Air Command in our daily task of building and maintaining readiness.

Over the past five months I have taken the opportunity to spend time with the combat crews of this Command and with the men and women who directly support those combat crews. I am impressed with the talent and drive and dedication to SAC's mission of maintaining peace through deterrence, and I take pride in your achievements. At the same time, I've seen a widespread conviction that we need to do more to find smarter and better ways of doing that daily work. To encourage and support that process, I have outlined some straightforward goals for commanders and su-

pervisors throughout Strategic Air Command. Those goals are to:

- Provide SAC people a living and working environment that promotes pride, professionalism and individual dignity.
- Increase the day-to-day readiness of our forces.
- Increase the quality of aircrew and missile crew training.
- Encourage innovation and initiative in finding ways to do our work better and smarter.
- Decentralize authority and responsibility and reward those who show they can do it better.

The first three require no further comment. We are taking specific and effective actions across the Command to make those things happen. The last two invite you to become an active part of the "they" who decide how we go about our daily business of building the highest possible state of readiness with the resources available to us. This is not an invitation to ignore the rules. It's an invitation to participate in the rule making. The purpose is to bring to bear the collective brainpower of those who must ultimately get the job done. I am totally convinced that this approach leads to excellence in performing our daily readiness mission and in the quality of life for those who perform that mission. Commanders at all levels in Strategic Air Command are committed to that approach. I invite you to take advantage of the opportunity. ★★★★★

Maj Michael E. Gentry
HQ SAC/DOJT, Offutt

Strategic Camouflage Scheme

— to be seen or not to be seen



In case you haven't noticed, our B-52s are getting a new paint job. What's the camouflage make-up all about? Read on.

The primary purpose of strategic camouflage is to deny the enemy easy visual detection of our bombers at low level, and recent exercise results support its effectiveness.

In the developmental stages, all of the major elements of camouflage were considered. Logic dictated that smoke, contrails, size or shape of the aircraft would not be affected to any large extent by the camouflage. The visual elements that are affected are contrast, glint, markings, pattern and color. These elements

B-52G



work together to either allow the aircraft to blend with its background or to cause it to stand out.

The contrast between the aircraft and the terrain was the first area addressed in SAC's research. The typical terrain reflectance value for the earth (disregarding desert and snow) is approximately 11 percent. This became the reflectance target value for the paint scheme, since the closer these two values, the better

the aircraft will blend into its background. Now, we know that the human eye uses contrast to differentiate some colors and shapes. Thus, the more an aircraft contrasts with its background, the easier it is to detect visually. In diminishing contrasts with background, a primary consideration was that the colors in the plan not contrast with each other. A value of 5 percent reflectance difference between individual colors

was selected. Reflectance of individual colors also had to be within 5 percent of the target value of 11 percent. An example of this balance is the suppression of aircraft markings which do not become visible to the naked eye until the observer is very close to the machine. This is exactly what happens between a low flying aircraft painted with strategic camouflage and its background.

B-1B



Speaking of markings, the next visual element considered was glint, which is a function of sun or moon angle, color (to a small degree) and surface finish on the aircraft. If the weather is clear and the aircraft has a glossy finish, then glint becomes a major aid to visual detection. We found glint can not be eliminated, but it can be reduced especially with regard to markings which include emblems, crests, tail numbers, and other painted areas on the aircraft. We decided to apply only low contrast, counter-shaded markings necessary for safety and maintenance, and added quality control measures to ensure that repeated application of the markings would not produce a glossy

area and thus compromise the scheme. HQ SAC is in the process of developing subdued low contrast SAC and unit crests that will blend with the new camouflage.

Now, on to the colors themselves. Pattern and color were studied together for the low contrast scheme. A pattern works primarily to help concealment when the aircraft is on the ramp, but also lends in breaking up the straight lines of the aircraft when observed in flight. The colors selected for the strategic camouflage scheme were chosen to blend with the most prevalent backgrounds and thus are a compromise designed to maximize the range of backgrounds that the aircraft can blend with. This approach led us to the three

colors in the camouflage plan: two shades of gray and one green.

This camouflage scheme will greatly enhance survivability, especially if the aircrew uses it wisely. The crew must be aware of the background they are flying over when at low altitude. If there is a choice as to flight path, then look for terrain that best complements the camouflage, such as a forest rather than a dry lake bed. For more information, see your unit tactics officer and read the December issue of **Tactics Crosstalk**.

In peacetime, the new camouflage makes our B-52s more difficult to see in crowded airways. Take heed!
— Ed.



FB-111



FAREWELL MR WAGNER

Mr OSHA Retires After 40 Years of Service

Mr Rocky Disbrow
HQ SAC/IGFG

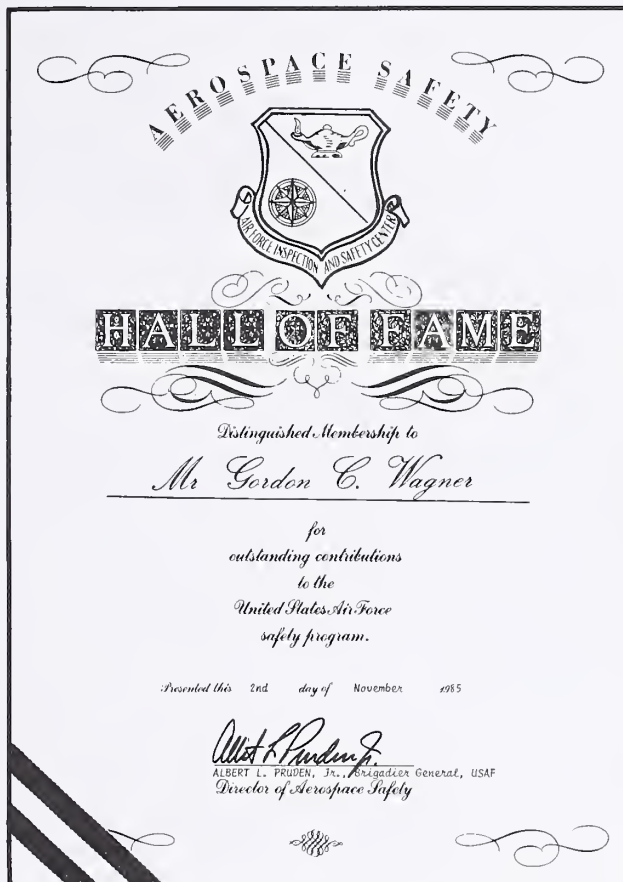
Mr Gordon C. Wagner, better known as "Wag," retired 1 November 1985, after 40 years in the safety profession. At his retirement ceremony, Brig Gen Lee Butler, SAC/IG, presented Mr Wagner with the Meritorious Civilian Service Award and a plaque commemorating his name being placed in the AFISC Safety Hall of Fame.

Back in 1941, he was a Safety Inspector on projects ranging from bridge construction to building ammunition plants. In early 1943, he was drafted by the U.S. Army and served in the Army Service Forces in explosive, railroad and vehicle safety activities. He received an honorable discharge in December 1945 following the close of WWII. In 1948, he entered Civil Service with the Nebraska Ordnance Corps serving as Chief of Safety and Security Division, and as Chairman of the Safety Subcommittee of the Integration Committee on Ammunition Loading established by the Defense Production Act of 1950.

In September 1956, Mr Wagner transferred from the U.S. Army Ordnance Corps to the U.S. Air Force at Offutt AFB, Nebraska, as 3902 ABW Ground Safety Manager.

In 1976, he became a Registered Professional Safety Engineer. He is a member of the National Safety Management Society and a Past member of the American Society of Safety Engineers. In 1973, he was selected for honorable mention for the Outstanding Professional by the Omaha-Lincoln Federal Executive Association.

Mr Wagner's footprints are visible throughout the SAC Ground Safety Program. His efforts played a principal role in our command's selection for the 1984 Air Force Chief of Staff Special Achievement Award recognizing, among many accomplishments, a ground safety effort that registered the lowest number of fatalities due to mishaps in our history. Widely known as Mr OSHA, his initiative, leadership, expertise and dedication are the hallmark of a superb professional whose performance has had a lasting impact on the United States Air Force. We are proud to have served with such an outstanding American.



Brig Gen Lee Butler, SAC/IG, presents an award to Mr. Gordon C. Wagner at SAC Headquarters recently.



A Pilot's View of the KC-135R

Capt Mark Conley
384 AREFW/DOV
McConnell AFB

Since the first KC-135R arrived at McConnell AFB the capabilities of this airplane have not ceased to amaze me. I knew that with its new engines and systems changes, the R model would be quite an improvement over the KC-135A; however, only after I started to actually fly it did I begin to realize its true potential.

Prior to my first flight in the KC-135R, I had read quite a bit of information about it. Most of the information was in the form of published articles which compared the KC-135R to the KC-135A by listing all the changes individually. Each improvement was easy to evaluate on a one-to-one basis, but the articles didn't really express

the collective impact of the changes on a tanker crew's ability to accomplish its mission. What was needed was a crew member's point of view. Therefore, I'd like to discuss some of the modifications from that perspective.

When I, as a pilot, think of the R model, I really don't consider each system individually. Instead, I think of how all the systems will collectively affect my mission capability. From a pilot's standpoint, the KC-135R is an exciting airplane to fly. With the CFM-56 engines, it has more power than one could ever dream available to a tanker. These engines provide a 69% increase in thrust over the old J57, as well as a tremendous increase in

reliability. Now, we can fly an EWO mission with the fuel tanks filled to capacity. With the fuel loads used during peacetime missions, the R model uses considerably less runway for takeoff than the KC-135A. Pilots can rest easier now, knowing that "lack of available runway" will hardly ever be a problem again. Another nice feature of the engines is the fire extinguisher system. Each wing contains two fire extinguishers. Even though there is one extinguisher available for each engine, two may be used on one engine, if necessary. Once the fire switch is pulled, the first extinguisher is automatically armed and can be fired at the press of a button. Activating the first extinguisher automatically arms



the second one so that it is available if the first one isn't successful. This is an excellent safety feature.

Even though the new engines are the most visible change to the R model, there are many internal changes which have a major impact on the crew. Many of these improvements affect the crew members directly, while other changes are more subtle, but still vitally important.

For one thing, this new version of the tanker is 95% quieter. This means that you can talk to each other across the cockpit without raising your voice. The noise level is even comfortable without a headset on.

The R model has two APUs (auxiliary power units). Either APU is capable of starting the engines, but only one of the APUs is capable of providing electrical power to

the airplane. For normal operation, we only use one APU, but for EWO we can run both APUs so that we can start engines two at a time. APU start switches are located at three places on the airplane. One is on the APU itself so the boom operator can start it, similar to the A model. Another switch is located on the pilot's instrument panel. This gives the copilot access to starting the APU during his preflight to control cockpit temperature. The third place is at the crew entry hatch. During an alert scramble, the crew can activate this switch while climbing the ladder and by the time the pilot is in the seat and ready to start engines, the APUs are running at full capacity. Not only do the pilots have the capability to operate the APUs from their positions, but they also receive information on APU operations. Status lights advise the pilots when

the APU doors are open, when there is a fire and when the APU is up to speed and ready to provide bleed air and/or generator power.

Many crew members consider the R model's climate control capability to be the biggest improvement. While on the ground, the APU can provide adequate heating or cooling throughout the year and the CFM-56 can provide plenty of airflow when you are flying. Since the APU can be operated while taxiing, the crew can enjoy a comfortable cabin temperature from preflight until they exit the airplane after the mission is completed. The new APU system also has an added safety feature. If the crew forgets to stop the APU before takeoff, the system is connected to a squat switch that will initiate a normal shutdown sequence and close the inlet/exhaust doors.

Another improvement is in the steering system. Now rudder pedal steering is available. Adequate steering control is provided during takeoff from either set of rudder pedals allowing copilots to execute the takeoff with complete aircraft control from the beginning of the takeoff roll. A transfer of aircraft control from the pilot to the copilot at 90 KIAS is no longer required. The pilot in the left seat still has the ultimate control though, since the tiller wheel will override the rudder pedals.

Two new features employed on the R model are the engine failure assist system (EFAS) and the yaw damper. Both systems provide limited automatic rudder inputs. The yaw damper virtually eliminates dutch roll by sensing the yaw rate of the airplane and making rudder inputs. The EFAS aids the pilot in the event of an outboard engine failure. By sensing N1 RPM differential, the rudder is deflected to aid in preventing adverse yaw resulting from asymmetric thrust. These systems work very well and I consider them invaluable.

The R model cockpit has a multitude of new gauges and lights. For instance, two RPM gauges provide information on each engine. The N2 RPM tells us the speed of the engine core which produces

— QUICK COMPARISONS —

KC-135A vs KC-135R

	(A)	(R)
ENGINE	J-57-P-59W	CFM56-2-B1
THRUST, LBS	13,750	22,000
OPERATING WT. LBS	106,317	119,235
FUEL, LBS	189,702	203,288
MAX GND WT, LBS	301,600	322,500
LANDING GEAR	EXISTING	NEW
BRAKES	4-ROTOR	5-ROTOR
ANTI-SKID	MARK I/II	MARK III
ELECTRICAL	3, 40KVA CSD	3, 40KVA IDG
STABILIZER, FT ²	500	545
YAW DAMPER	AUTOPILOT	SERIES
TEMS	NONE	NEW (auto)
QUICK START	CARTRIDGE	APU (2)
FIRE EXTINGUISHER	NONE	NEW (2/wing)
ENGINE FAILURE ASST	NONE	NEW
NOSE WHEEL STEERING	TILLER	PEDAL COUPLED
FUEL TEMP SENSOR	NONE	NEW

The KC-135R has 70% more thrust and is 27% more fuel efficient, reduces noise by 98%, and reduces exhaust smoke by 92% compared to the KC-135A.



“From a pilot’s standpoint, the KC-135R is an exciting airplane to fly. With the CFM-56 engines, it has more power than one could ever dream available to a tanker.”

the power to turn the fan (N1). Both of these gauges are similar to their old counterpart in the A model except that they provide a digital readout as well as an RPM pointer. The EGT gauge also has an added feature. It displays a warning light to indicate an over-temp on takeoff. All three of these gauges provide the best of both worlds by presenting two kinds of information. The digital readout is necessary for accuracy in reading the gauge, while the pointer gives you trend information at a glance. New gauges added to the instrumental panel include an engine oil and fuel temperature gauge. The oil temperature gauge shows the highest oil temperature of the four engines. An associated selector switch allows you to review the oil temperature of each individual engine. The fuel temperature gauge shows the fuel temperature in the #1 main fuel tank. This information is helpful in determining the usability of various alternate or emergency fuels. Although we have successfully flown tankers for years without these two new gauges, they are, nevertheless, important in making the R model more versatile and adaptable to new roles. A warning light, associated with all the lights on the overhead panel, has been added to the copilot’s side of the instrument panel. If any of these lights come on, the OVHD PANEL warning light also illumi-

nates. This is particularly useful during the takeoff, allowing the pilots to look outside and not up at the overhead panel. The pilot’s side of the instrument panel has several new warning lights also. If either the EFAS or the yaw damper fails, there is an associated warning light to inform the pilot. There is also an ASM THRUST (asymmetric thrust) light that comes on when the EFAS senses a difference of 1500 N1 RPM or more between the outboard engines. All of these new warning lights help the pilots deal with abnormal conditions faster and more efficiently.

The changes to the electrical system are something that the copilots will appreciate. There are new integrated drive generators on engines 1, 2 and 3. The airplane electrical system itself is basically unchanged, but these new generators are a vast improvement. When a generator is up to speed during the engine start, it automatically puts itself on line with the electrical system. If the airplane was being powered by the APU or externally, the generator slips into the system while tripping the original power source off the line. The transition is so smooth that it is hardly noticeable. The entire system is automatic and copilots will never have to balance

another load or manual parallel again.

This article would be incomplete without a rave review of the R model’s flight manual. Much effort has been spent rearranging the location of information in the Dash-1. The net result is that a crew member can more efficiently research a problem or malfunction. Many of the problems that were located in the emergency section of the A model Dash-1 have been moved to Section 1 in the R model Dash-1. This allows the normal description of an item or system to be followed by a list of abnormal situations. This is a vast improvement over the old system of looking in several places for the solution to a problem. The emergency section has been reserved strictly for emergency situations.

The improvements I have mentioned here are just a few of the more prominent modifications that are unique to the KC-135R. There are many more changes too numerous to list here. The R model is a fantastic combination of the KC-135A and modern technology; however, many of the old characteristics of the A model are gone. There are new systems and limits to learn. Even some of the BOLD PRINT has changed. It is a “new” and different airplane, but we can’t forget its origin since it is really just a good old reliable A model that’s been improved.



A Titanic Undertaking

Maj David D. Chacey, Jr.
381 SMW, McConnell AFB

The Titan II weapon system, now undergoing deactivation at both McConnell AFB, Kansas, and Little Rock AFB, Arkansas, is an intricate composition of facilities, airborne components and command/control systems. It requires a massive array of pumps, motors, actuators, control valves, and electrical systems to monitor and load its liquid propellants; air conditioning compressors, controls, fans, and ducting to keep the propellants and guidance system cool; huge hydraulic motors and associated equipment to open the massive launcher closure door and operate the six sets of hydraulically operated maintenance platforms; sound and fire suppression systems that require miles of piping; numerous water controls and meters; and various fluid and gaseous pressurization subsystems.

Titan II has a large combat crew facility capable of extended operations without outside supply of fuel, food, water or supplies. An extensive system of electrical generation/control equipment, diesel power generation, and electrical monitoring equipment is necessary for all operational modes. The missile facility incorporates five separate water handling systems to fight fires, suppress launch noise, chill equipment air, and support the crew. Command, Control and Communication (C3) equipment is located throughout the missile complex and represents one of the largest groups of equipment within the site.

The dismantling, unloading, and removing of these systems are a challenge to the crews and technicians entrusted with the "Rivet Cap" project. Few outside of the system really know what deactivation means to the officer or technician participating in this massive program. This article will acquaint the uninitiated with deactivation from the working man's level.

Deactivation begins months ahead of the first off-alert day. Maintenance Control, working with HQ SAC, San Antonio ALC, and Ogden ALC, plans projected movement of propellants, missiles, ordnance and payloads. They then schedule shipping, transportation, and maintenance requirements to ensure that the many components of the system can be shipped, when removed, to various locations throughout the country. Through this coordination, finely balanced timetables are created that detail when ordnance, payload, and propellants can be removed from the complex. The schedule, as in all maintenance areas, is the plan by which the right item is removed in the right order from the right complex in order to ship it to the right location at the right time. With a fully coordinated schedule matched to a maintenance task flow chart, a plan of action for deactivation of the complex is complete and



ready to be executed by scheduling control, job control, and the technicians in the field.

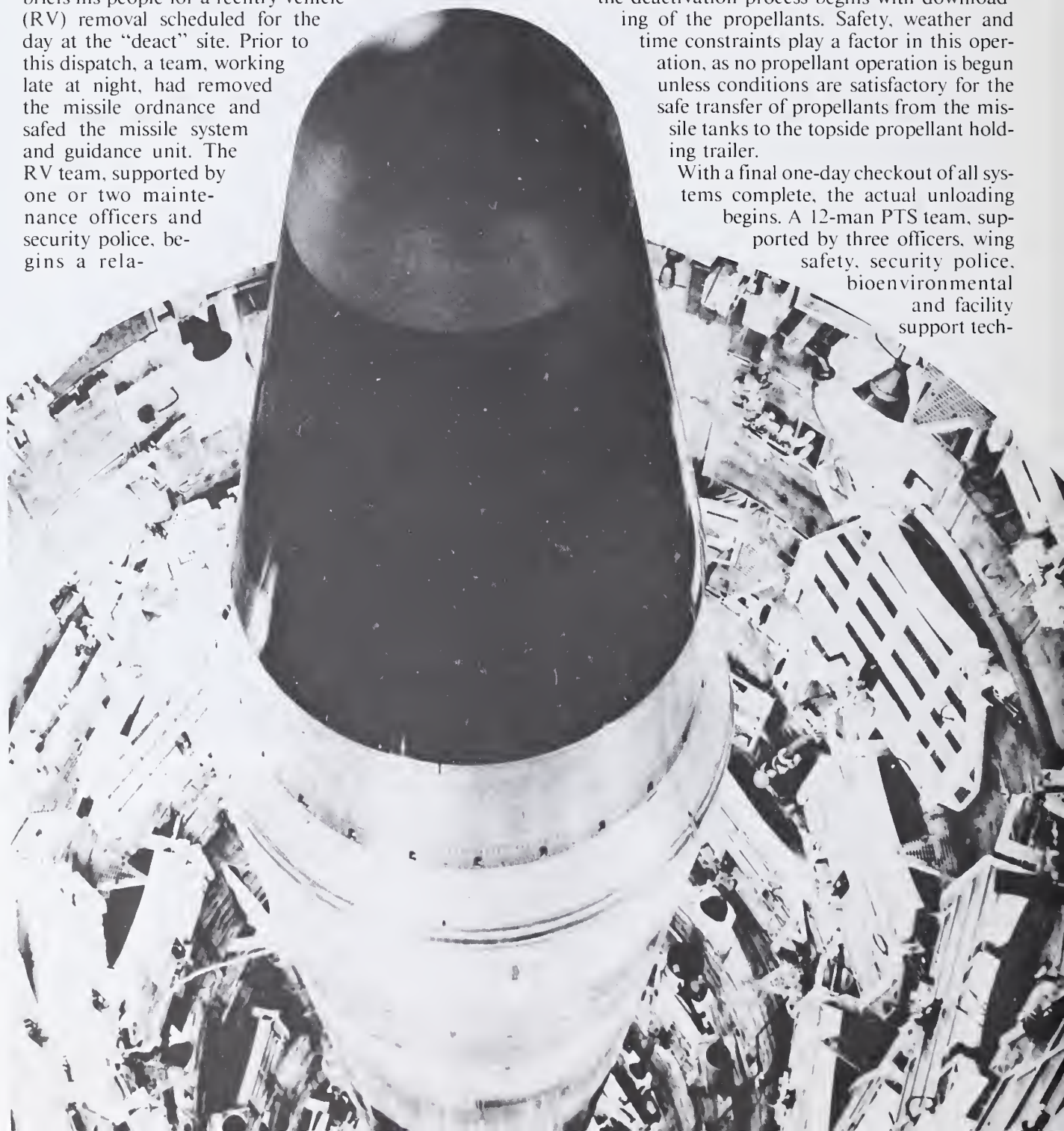
Weeks ahead of the off-alert day, the propellant transfer system (PTS) technicians and the missile maintenance technicians (MMT) begin moving propellant transfer equipment to the site and connecting hoses, air lines, and numerous pieces of control equipment. This three-week process represents one of the largest undertakings of the deactivation effort. Weather and safety requirements are stringent and most of the connections require use of the rocket fuel handler's clothing outfit. Nitrogen tube banks, holding trailers, conditioning

trailers, and control valves must be installed for both fuel and oxidizer subsystems, as well as a control trailer, vapor suppression system trailer, vapor scrubber trailer and other trailers and equipment common to the two propellants. In addition, no propellant tasks are scheduled until numerous hazard mitigation systems on the site have been tested and ensured operable. In total, over three weeks are needed just to start the "major maintenance" of actual deactivation.

The first full off-alert day begins at 0500, or possibly as late as 0600 hrs. An MMT team chief briefs his people for a reentry vehicle (RV) removal scheduled for the day at the "deact" site. Prior to this dispatch, a team, working late at night, had removed the missile ordnance and safed the missile system and guidance unit. The RV team, supported by one or two maintenance officers and security police, begins a rela-

tively short day that consists of physically disconnecting the payload from the missile and electrically disconnecting numerous control and monitoring circuits. During this time the crane is positioned, the launch duct door opened, and a handling adapter attached to the RV. It is slowly raised, positioned on the reentry vehicle trailer, and returned to base. If everything goes smoothly, the team may be back by 1500 hrs that afternoon. The first major task is complete when the RV is partially dismantled at the base and various components shipped to storage. The second major phase of the deactivation process begins with downloading of the propellants. Safety, weather and time constraints play a factor in this operation, as no propellant operation is begun unless conditions are satisfactory for the safe transfer of propellants from the missile tanks to the topside propellant holding trailer.

With a final one-day checkout of all systems complete, the actual unloading begins. A 12-man PTS team, supported by three officers, wing safety, security police, bioenvironmental and facility support tech-



“From start to finish, a missile complex requires around 45 days of continuous hard work to deactivate, then in a few months, wheat will grow where once a mighty engine of war lurked deep beneath.”

nicians, starts a critical day of pumping the missile propellant tanks dry. Technicians and officers connect fill and drain lines to the missile, pressurize the tanks, and start specially designed pumps that force the liquid topside into holding trailers. One propellant, either fuel or oxidizer, can be unloaded in a single day. While the launch duct team (two technicians and an officer) monitors the unloading process below ground, another team monitors the filling of the trailer topside. Maintenance officers and the PTS team chief monitor weather, safety and procedures throughout the operation, with the support of quality assurance and the other specialists mentioned earlier. Usually by the late afternoon the missile tanks are dry and a relief team is on site to finish the hundreds of small steps still required to environmentally safe the propellant transfer system. Within a few days the other propellant will be unloaded in a similar manner. All totalled, at least 400 man-hours per day are spent to unload just one of the two propellants.

However, PTS has just started. The 250,000 pounds of propellants in static storage topside must then be transferred to commercial tankers for relocation or reuse in other programs. Nine to ten tankers will be filled with fuel or oxidizer over a two-week period, acceptable weather permitting. The support specialists and teams described earlier dispatch every day until the holding trailers are empty and purged of remaining propellants.

The specialists on the complex are not the only people involved, of course. On a “flow day,” the wing commander, deputy commanders for operations and maintenance, standboard crew members, and a literal host of others are also deeply involved in ensuring the operation proceeds according to plan. This considerable array of talent converges in a small but well equipped room to monitor every action of the many teams on site. At least 100 man-hours each flow day are expended by this propellant transfer evacuation and safety team for the single purpose of maintaining weapon system and personnel safety.

The removal of the 103 foot long Titan II missile airframe begins the day after the last propellants have been removed. MMTs, supported by maintenance officers, quality assurance and safety personnel, prepare the missile on one day and physically remove it the next. Weather permitting, the second stage is bolted to a large

handling ring suspended from a crane and then disconnected from the first stage. The second stage is slowly lifted from the silo and brought horizontal to rest on its trailer. The larger first stage is then removed in a similar manner. The MMT team chief supervising the operation is responsible for thousands of details in this simple sounding but complex task. The missile stages, protected and covered, are secured to their trailers and convoyed to the support base. The MMT section alone will have expended 20-25 specialists over a 20 hour period in order to complete this task.

With the missile removed, PTS is again on site to environmentally safe the miles of propellant piping and dozens of controls still remaining in the silo. Nitrogen is forced through the stainless steel pipes until toxic levels reach a safe point. Components needed for the next site are then removed, as are specific components identified for special handling. These environmental purges can be completed in only a week, but have routinely taken longer due to weather and site peculiarities. By the end of this task, a PTS technician may have dispatched to this site four weeks out of five, every day, for 8-12 hour tasks. Security police, bioenvironmental, facility, quality assurance, and other specialties have been there with them throughout the period.

Deactivation planning identified a need to remove diesel fuel, hydraulic fluid, water, spare parts, communication equipment and command/control equipment from the sites prior to destruction. Electronics, facility support, PTS, communication services, civil engineering and other specialists converge on the “deact” site starting the day after a missile pull. They drain thousands of gallons of diesel fuel, water, and hydraulic fluid and remove large pieces of command and control equipment. They also remove sensitive devices and scour the site for additional parts needed for alert missiles. Within a two-week period all remaining usable parts, fluids, and equipment have been removed and the site is ready for caretaker status supervised by the Base Civil Engineer. The sites are still available should a spare part be needed for an EWO sortie until turned over to a civilian contractor for demolition.

From start to finish, a missile complex requires around 45 days of continuous hard work to deactivate. On an average there may be as many as 10 technicians working that site per day, with even more on site during major maintenance days. Every specialty has an important job to do, be it equipment removal or providing complex security. It is a mammoth undertaking, expending thousands of highly trained man-hours per complex. But they do it well with one goal in mind, “DEACT SAFELY.”

The contractor's job is to destroy the complex and leave the area as environmentally pure as possible. Toward this goal, the site is almost totally destroyed and then backfilled, sealed, and covered with earth. In a few months, wheat will grow where once a mighty engine of war lurked deep beneath.



Death of a Slipstick

SSgt Rich Radvanyi
CFIC, Castle AFB



The computer age has finally reached the boom operator. Soon you'll be able to trade in your trusty old load adjuster for a brand new HP-41 programmable calculator. Why? Because soon KC-135 weight and balance will be computed in moments instead of using a load adjuster. Now why would anybody want to part boom operators and their "slipsticks?" First, computing weight and balance using moments is more accurate than using a load adjuster. Second, the KC-135R uses moments because it was too cost prohibitive to create a new load adjuster for the aircraft (about \$1100 per unit). And third, the new FSA/CAS system computes its weight and balance information using moments.

Although the HP-41 calculator will be predominantly used in weight and balance calculations, it is important to understand some terminology and manual applications while using moments. So just what exactly is a moment anyway? In order to understand moments we need to look at some basic weight and balance terms and definitions. **MOMENT:** a measure of the rotational tendency of a weight about a point. The moment of an item is

the item's weight multiplied by its arm. **ARM:** the distance of a weight from a reference datum (see fig 1; the arm for the center of J Compt. is 860 inches). **REFERENCE DATUM:** a zero reference position from which distances are measured. The reference datum for the KC-135 is 130 inches in front of the nose (see fig 1).

So what does all this mean in plain english? Instead of slipping a weight into a compartment using the load adjuster, you have to find the arm for the compartment that you are using and then multiply the weight of the object with the arm of the compartment. This will give you that object's moment. OK, where do I find the arms for the different compartments? Look in T.O. 1C-135(K)A-5, Sect. III, Chart E Loading Data. Here you will find all the charts listing all the arms for all the compartments, fuel tanks, crew, water, etc. (see fig 2).

If you multiply some of these values, you will find that you wind up with some pretty big numbers, so big that they don't fit on the Form F. So in order to simplify things, we use a simplified moment. A simplified moment is a moment divided by an established constant

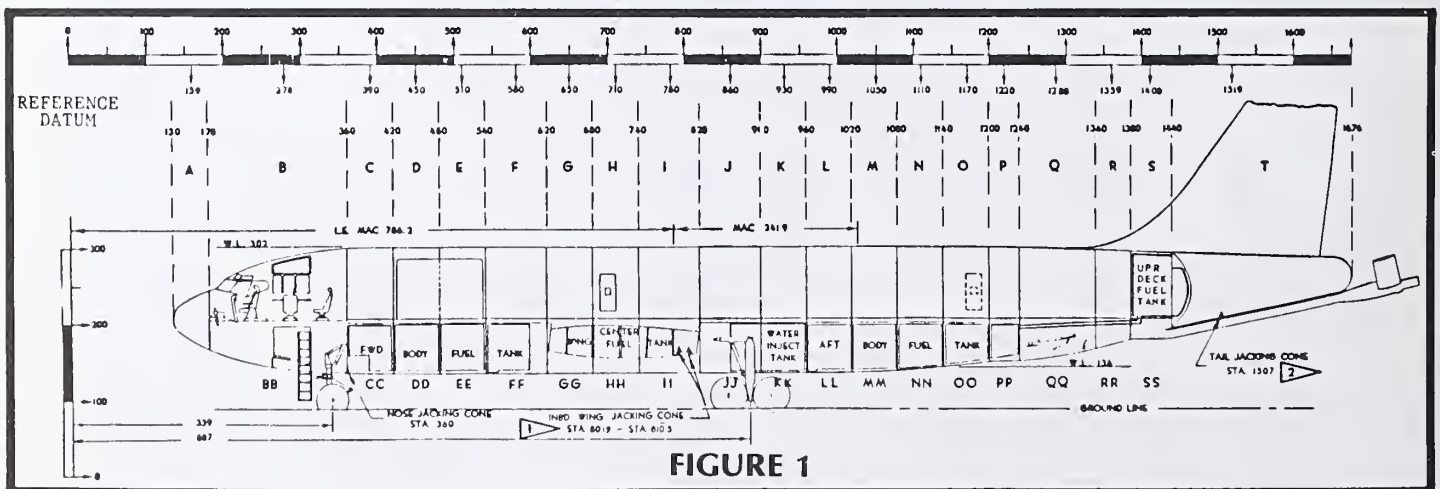


FIGURE 1

COMPARIMENT LOADING TABLE

WEIGHT POUNDS	COMPARTMENTS UPPER															
	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	ARM 278	ARM 390	ARM 450	ARM 510	ARM 580	ARM 650	ARM 710	ARM 780	ARM 860	ARM 930	ARM 990	ARM 1060	ARM 1110	ARM 1170	ARM 1220	ARM 1288
MOMENT 1000																
100	28	39	45	51	58	65	71	78	86	93	99	105	111	117	122	129
200	56	78	90	102	116	130	142	156	172	186	198	210	222	234	244	258
300	83	117	135	153	174	195	213	234	258	279	297	315	333	351	366	386
400	111	156	180	204	232	260	284	312	344	372	396	420	444	468	488	515
500	139	195	225	255	290	325	355	390	430	465	495	525	555	585	610	644
600	167	234	270	306	348	390	426	468	516	558	594	630	666	702	732	773
700	195	273	315	357	406	455	497	546	602	651	693	735	777	819	854	902
800	222	312	360	408	464	520	568	624	688	744	792	840	888	936	976	1030
900	250	351	405	459	522	585	639	702	774	837	891	945	999	1053	1098	1159
1000	278	390	450	510	580	650	710	780	860	930	990	1050	1110	1170	1220	1288
1100	306	429	495	561	638	715	781	858	946	1023	1089	1155	1221	1287	1342	1417
1200	334	468	540	612	696	780	852	936	1032	1116	1188	1260	1332	1404	1464	1546
1300	361	507	585	663	754	845	923	1014	1118	1209	1287	1365	1443	1521	1586	1674
1400	389	546	630	714	812	910	994	1092	1204	1302	1386	1470	1554	1638	1708	1803
1500	417	585	675	765	870	975	1065	1170	1290	1395	1485	1575	1665	1755	1830	1932
1600	445	624	720	816	928	1040	1136	1248	1376	1488	1584	1680	1776	1872	1952	2061
1700	473	663	765	867	986	1105	1207	1326	1462	1581	1683	1785	1887	1989	2074	2190
1800	500	702	810	918	1044	1170	1278	1404	1548	1674	1782	1890	1998	2106	2196	2318
1900	528	741	855	969	1102	1235	1349	1482	1634	1767	1881	1995	2109	2223	2318	2447
2000	556	780	900	1020	1160	1300	1420	1560	1720	1860	1980	2100	2220	2340	2440	2576

CREW WEIGHT TABLE

CREW WEIGHT POUNDS	PILOT	COPILOT	NAVIG.	BOOM OPERATOR	
	ARM 230	ARM 230	ARM 255	NORMAL POSITION ARM 326	REFUEL POSITION ARM 1300
	MOMENT 1000				
250	58	58	71	82	325

WATER INJECTION TABLE

VOLUME GALLONS PER AIRPLANE	WEIGHT 8.33 LBS. PER GAL. POUNDS	ARM	MOM 1000
670	5581	924.4	5157

OIL TABLE

VOLUME GALLONS	WEIGHT 7.7 LBS PER GAL POUNDS	MOM 1000
22	169	130

FIGURE 2

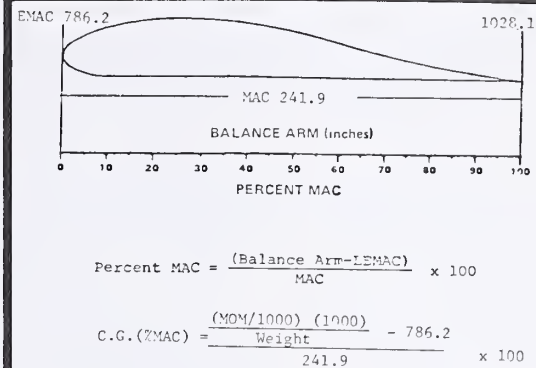


FIGURE 3

edge of the MAC and 100.0% at the trailing edge. For weight and balance purposes, percent MAC is found by a simple mathematical conversion equation or tables, peculiar to the aircraft, and listed in the CHART E (see fig 3). If you look in the A-5, Sect. III, you will find the formula for computing C.G.:

$$\text{C.G. (\%MAC)} = \frac{(\text{MOM}/1000) (1000)}{\text{Weight}} - 786.2 \div 241.9 \times 100$$

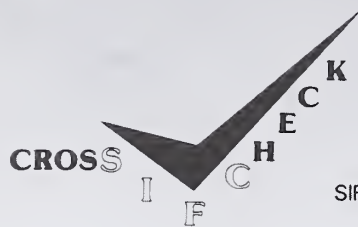
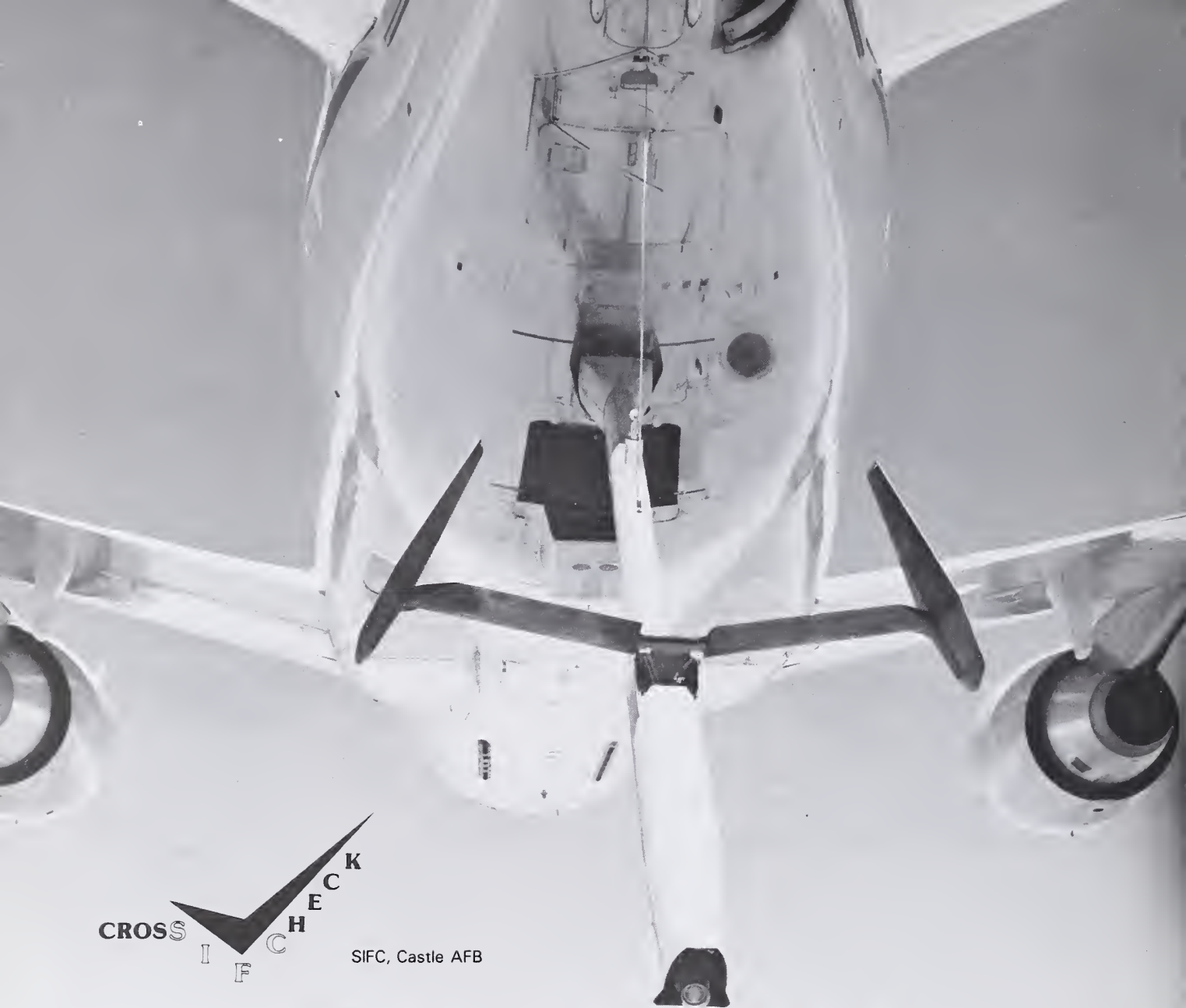
There are two numerical constants used in this formula, 241.9 and 786.2. The number 241.9 is the length of MAC. As such, it is a constant length that is used in the calculation of center of gravity location in terms of percent MAC. The number 786.2 is the LEMAC, or leading edge of the mean aerodynamic chord. The LEMAC is usually identified as a fuselage station (786.2), and is used to identify the leading edge of the MAC (see fig 4). These two numbers plus your takeoff weight and moment are thrown together to compute the C.G.

Sounds like fun, huh? Well, that's where the HP-41 calculator comes in. Once you get acquainted with this calculator and the weight and balance program, it will be just like adding numbers on a regular calculator. Remember though, the information that you get out is only as good as the information that you put in, so be careful. Hopefully this article will help you better understand some of the terms and operations used in computing moments, and also help you understand what's going on inside that little computer while you're punching in all those numbers.

such as 100, 1000, or 10,000. For the KC-135, we use moment divided by 1000 or MOM/1000.

I've added my weights and I've added my moments and I've got my takeoff weight and moment. So how do I get my C.G.? First, let's review just what a "C.G." is. C.G. stands for center of gravity, which is the point at which an object's

weight may be assumed to be concentrated and about which the object would balance if suspended. For our use, the location of the aircraft C.G. is commonly expressed not by its balance arm, but by percent or mean aerodynamic chord (MAC). Percent MAC identifies a location with respect to the position of the MAC — 0.0% at the leading



SIFC, Castle AFB

ARE YOU READY FOR RNAV?

In case you haven't heard, the FB-111, B-52, and K/R/E/C-135 aircraft have caught up with the KC-10 and the E-3A and have been approved for Random Area Navigation (RNAV) for enroute use only. The HQ USAF Instrument Flight Center (IFC) is in the process of developing DOD FLIP Planning Procedures and aeronautical charting for RNAV. Complete information should be published in FLIP General Planning in February of 1986. What do we do until this information comes out? The Airman's Information Manual (AIM), para 298d and FLIP GP para 5-49 have some RNAV

flight plan filling procedures published that should suffice until then.

Before we go over these procedures, let's take a quick look at the RNAV system. Except for a few high altitude Alaskan routes, there is no longer a U.S. RNAV route system. Pilots may file for random RNAV routes throughout the National Airspace System (CONUS) where radar monitoring by ATC is available. Although ATC will radar monitor each flight, guess where the responsibility for navigation of the random RNAV route lies? You guessed it — the pilot in command.

There are some factors that ATC will take into consideration before they approve a request for a random RNAV route. One concerns their capability to radar monitor the flight, and the route's compatibility with traffic volume and flow.

Now that we've got some basics out of the way, how do we file a flight plan? There are two different ways to file RNAV routing. One is based on radial/DME fixes from NAVAIDS (much like degree-distance rules), and the other is based on latitude/longitude coordinates.

Since most SAC aircrews file radial/DME fixes, the first set of procedures will be most applicable to us.

In filing random RNAV routes based on radial/DME fixes, pilots are expected to:

1. File airport to airport flight plans prior to departure.

2. File the appropriate RNAV capability certification suffix in the flight plan (i.e., H/B-52/R, KC-135/R FB-111/R in the aircraft designation block of DD Form 175).

3. Plan the random route portion of the flight plan to begin and end over appropriate arrival and departure transition fixes or appropriate navigation aids for the altitude structure being flown (high or low).

4. File route structure transitions to and from the random route portion in the flight plan. The use of normal preferred departure and arrival routes, such as a SID and STAR, or an IAP, is recommended.

5. Define random routes by waypoints. File route description waypoints using degree-distance in reference to NAVAIDS for the appropriate altitude (just like we've always done. Example: RNO 260010 is a waypoint). You could also file direct to the NAVAID (example: RNO) or to any five letter named intersection.

6. (The Clincher). File a minimum of one route description waypoint for each ARTCC's area over which the random RNAV takes place. These waypoints must be located within 200 NM of the boundary of the preceding center's flight advisory area (a flight advisory area is the ATC area defined by the hatched light blue sector lines drawn on the high or low altitude charts).

7. File an additional route description waypoint for each turnpoint in the route.

8. Though not required in the flight plan, plan additional waypoints necessary to ensure accurate navigation via the field route of flight (this is a hip pocket, back-up plan). Remember, navigation is the pilot's responsibility unless ATC assistance is requested.

9. Plan your route of flight to avoid prohibited and restricted airspace unless you obtain permission to operate in that airspace and then advise ATC.

Now let's examine procedures for an ATC clearance for random RNAV routing using latitude/longitude coordinates.

1. File at FL 390 or above for the random RNAV portion of flight. This restriction makes the latitude/longitude RNAV filing impractical for most of the flying we do in SAC.

2. File airport to airport flight plans prior to departure.

3. File the appropriate RNAV capability certification suffix in the flight plan.

4. Plan the random RNAV route portion of the route to begin and end over published departure/arrival transition fixes or appropriate navigation aids for airports without published transition procedures. The use of preferred departure and arrival routes, such as a SID and STAR where established, is recommended.

5. Plan the route of flight to avoid prohibited and restricted airspace by 3 NM unless you have permission to operate in that airspace and the appropriate ATC facility is advised.

6. Define the route of flight after the departure fix, including each intermediate fix (turn point) and the arrival fix for the destination airport in terms of latitude/longitude coordinates plotted to the nearest minute. The arrival fix must be identified by both the latitude/longitude coordinates and a fix identifier (either three letter, five letter named fix, or radial DME).

7. Record latitude/longitude coordinates by four figures describing latitude in degrees and minutes followed by a slash and five figures describing longitude in degrees and minutes.

8. Fly all routes/route segments on Great Circle Tracks. INS and OAS fly Great Circle Tracks.

9. Make any inflight requests for random RNAV clearances or route amendments to an enroute ATC facility.

As you can see, the procedures for both methods of filing are similar. Perhaps the most important thing to remember when flying RNAV is that the pilot is still responsible for navigation. The pilot is also responsible for notifying ATC of equipment malfunctions. If the INS breaks or is found to be out of tolerance, the pilot must advise ATC that the aircraft is no longer RNAV capable. Radar separation will always be applied to RNAV flights. Your RNAV clearance will be canceled if ATC loses its radar in which case you will be given another clearance. Currently, use of coordinate RNAV procedures is not authorized in New York, Cleveland, and Chicago Centers. Aircraft that are vectored off their planned route will be cleared direct to the next flight plan waypoint or issued a revised clearance. It is also now "legal" to ask for INS direct to any point as long as your INS/OAS is functioning properly.

Now if you feel confident about RNAV go out and try it — you'll like it. Remember, though, identifying your aircraft as RNAV capable in the aircraft designation block of the DD Form 175 doesn't require you to file using RNAV procedures. You may still file a normal degree-distance flight plan. However by putting the "R" designation on the DD Form 175, you are advising ATC of your capabilities and allowing yourself more flexibility in navigation. So, until next month, **happy RNAV flying.**

CROSS SAFETY FEED

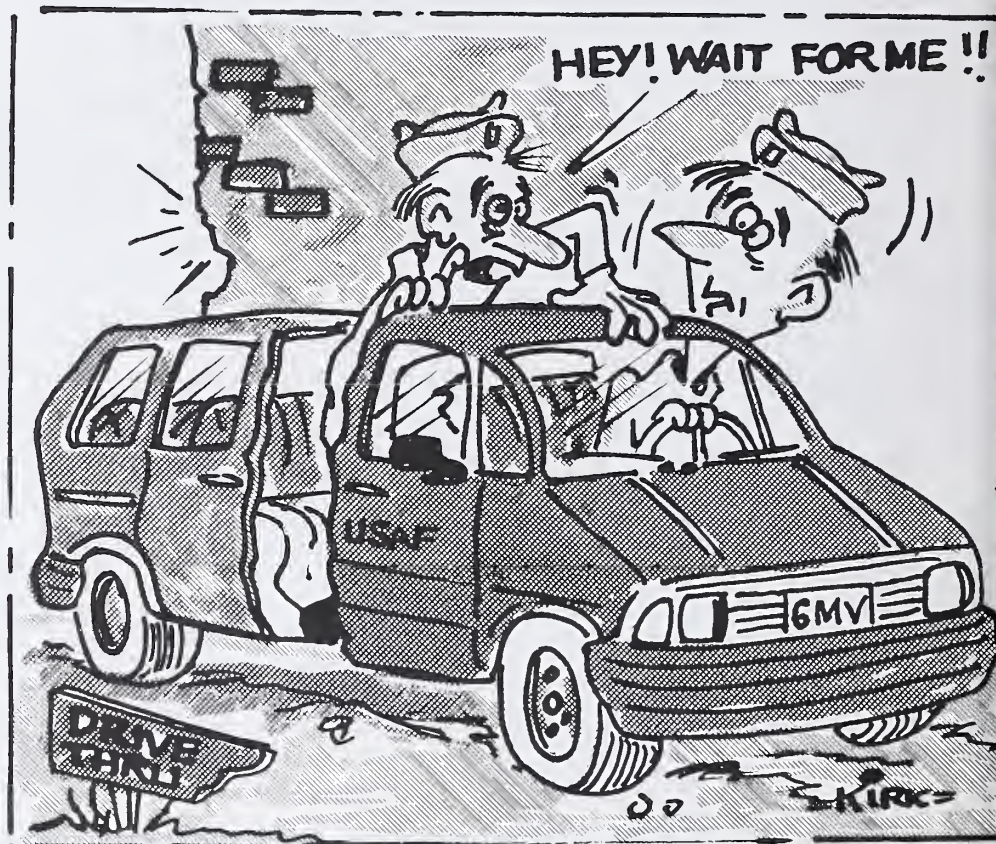
WEAPONS SAFETY

Look Out Below

A missile maintenance team dropped a quick release pin while working in a launch duct. Fortunately, they were below the missile and no damage occurred — this time.

You Deserve a Break Today

A missile maintenance team decided to stop for lunch at a fast food restaurant. While driving around to the carry out window, the driver cut a turn too short and struck the building, putting a 15-foot gash in the side of his GMV.



GROUND SAFETY

Macho Man

A SSgt refused a friend's offer to help him move a wrought iron loveseat. His determination proved stronger than his muscles, and he spent five days in the hospital recovering from the severe lower back pain.

Put Your Best Foot Forward

During a karate tournament, a SrA attempted a blind spin kick which fell short of its target. Not so with his opponent, however. His perfectly executed kick to the SrA's midsection required two days off work to heal.

Temper Tantrum

A motorcyclist got mad and chased a car that nearly collided with him. Following the car too closely at a high rate of speed, he had to brake hard when the car suddenly stopped. The cycle's brakes grabbed and threw the rider over the handlebars. Losing his temper turned a near miss into serious neck and back injuries.

Topsy Turvy

An airman sitting on a third floor balcony railing stood up, became disoriented and fell backwards over the railing. Blood tests revealed a BAT of .17 — no wonder he was tipsy!

Turn, Turn, Turn

While working on the carburetor of his truck, an NCO's foot slipped, causing him to fall into the spinning radiator fan. He suffered deep lacerations to his finger, causing nerve and tendon damage.

Chain Saw Massacre

A 2Lt helping a friend cut firewood reached for a piece of wood near the spinning chain saw blade. The results are too gruesome to relate.

Tackling Dummy

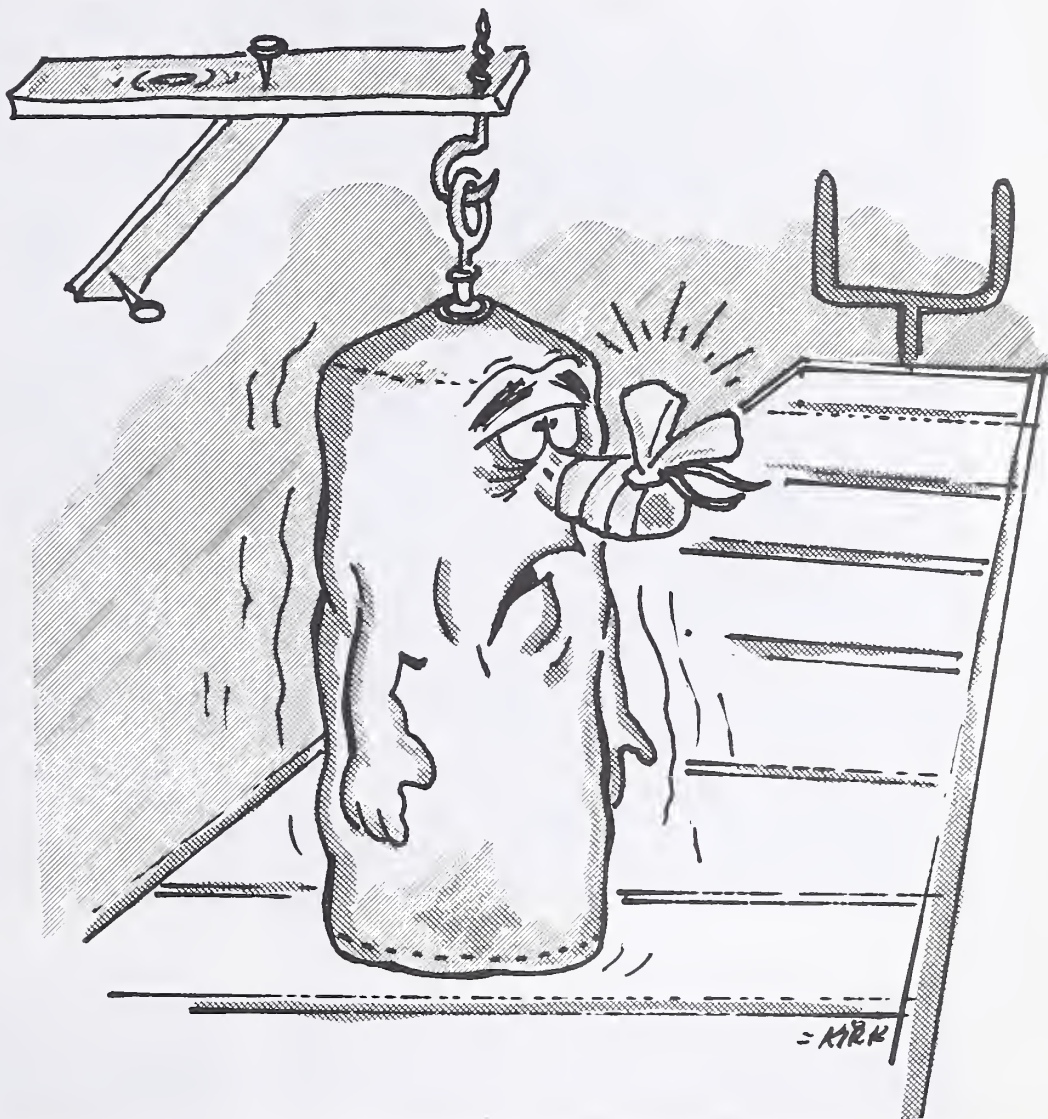
An overaggressive airman attempting to stop an opponent during a flag football game ended up with a broken nose when he decided to tackle the ball carrier rather than play by the rules.

Quick Draw McGraw

The fish were not biting so an airman decided to do some target practice on a lake. As he drew his pistol it discharged, striking him in both legs. He had 30 days in the hospital to think about gun safety.

Russian Roulette

A life-of-the-party type decided to liven up a dull group. He pulled out a handgun, insured that it was unloaded, put it to his head, and pulled the trigger. The round he missed didn't kill him, but left a permanent reminder on his neck and scalp.



FLYING SAFETY

Pressed His Luck

A receiver student refueling training mission was going well until the receiver requested that the tanker make shallow turns and turn off the director lights. The receiver exceeded the forward right limit, prompting an emergency breakaway and causing ice shield damage to the tune of \$8100.





UP FROM THE ASHES

Maj Bob Neidrick
Editor

The 97 BMW from Blytheville AFB has won the 1985 SAC Bombing and Navigation Competition. "Up From the Ashes" was a slogan frequently heard at Blytheville AFB as the men and women of the 97th recognized the tremendous accomplishments of their wing after a recent past of disappointing competition results. The culmination of their comeback, winning the coveted Fairchild Trophy, was announced the evening of 12 November 1985, by Maj Gen H. T. Johnson, SAC Deputy Chief of Staff Operations, at the BOMB COMP symposium held at Barksdale AFB.

The Fairchild Trophy is awarded to the SAC collocated bomber-tanker wing with the best combined bombing and navigation team score. It is named in honor of Gen Muir S. Fairchild, WWI bomber pilot and former Vice Chief of Staff of the Air Force.

The victory was particularly sweet for the 97 BMW because it was their first Fairchild since 1951 when the

March AFB's 452 ARW was the proud recipient of both the Saunders and the Navigation trophies.



97th was located at Biggs AFB, TX flying B-50Ds. It also marked only the second time since 1974 that a non FB-111A unit has won the annual competition. The Blytheville crews achieved a competition effectiveness (CE) of 0.9300 to win. Crews from the 92 BMW, Fairchild AFB, finished an extremely close second with a CE of .9272. A vast improvement in scores over the past two years has been noted. Last year's winning score

Gen Larry D. Welch, CINCSAC, congratulates Col Paul M. Matthews, commander of the 97th BMW.



The Mathis Trophy went to the 97th BMW, Blytheville AFB.



The 7th BMW, Carswell AFB, took home the John D. Ryan B-52 Trophy, as well as the James F. Bartsch ECM Trophy.



Winner of the Meyer Trophy was RAF 2, Marham UK.



The William J. Crumm Linebacker Memorial Trophy was awarded to the 416th BMW from Griffiss AFB.





RAF 1 from Marham captured the prestigious Curtis E. LeMay Bombing Trophy.



The Russell E. Dougherty SRAM Trophy and the General B. L. Davis Most Improved Unit Award went to the 319th BMW, Grand Forks AFB.



Best B-52 Crew, 5 BMW, Minot AFB.



Best FB-111 Crew, 509 BMW, Pease AFB.

was .9137 and the winning CE from 1983, .8154, would not have cracked the top ten this year. This is a credit both to new equipment, predominantly the offensive avionics system (OAS) conversion in the B-52's, and the enhanced proficiency of SAC combat crews.

Although the 97 BMW also took home the Mathis Trophy, awarded for the highest total points compiled in both high and low level bombing and time control, their principal goal was the Fairchild. In an interview with members from two of the winning Blytheville crews, two aircraft commanders, Major Terry Martin (B-52, Crew S-22) and Capt Paul Vinci (KC-135, Crew S-109) attributed their victory to two factors: consistency and a total wing effort. "We were not interested

in individual crew awards or other trophies, our game plan was to perform well in all categories and not strive to necessarily be the best in any individual area." They followed their game plan well, finishing in the top ten in every eligible category and in the top five for most. The crew members stressed that everyone at Blytheville was a part of the victory. They were especially appreciative of the efforts of maintenance personnel who consistently provided excellent equipment and ensured an on time takeoff for every sortie. "Our families also contributed a great deal. One morning, after we landed at 0330 in a pouring rain storm, our wives were waiting on the ramp to greet us with a hot meal — that's support."

The 97 BMW began their selection process in February by forming crews made up of their most consistent performers. According to Capt Vinci, "you can't have a three month program and expect to do well in BOMB COMP."

The annual competition has four objectives: demonstrate strategic bomber and tanker capabilities; promote international relations in a friendly competitive environment; test new equipment, procedures, tactics and concepts; and enhance esprit de corps by recognizing crew and unit professionalism.

Competing for 19 various trophies were aircrews and maintenance people from all of SAC's bomb and air refueling wings (excluding overseas units), including the Air National Guard and Air Force Reserve. Flying F-111D's, Tactical Air Command's 27th Tactical Fighter Wing also competed as well as the Royal Air Force's 27th Squadron, flying Tornados.

Scoring for the competition was accomplished by the 1st Combat Evaluation Group (ICEVG) headquartered at Barksdale AFB. ICEVG was involved with the operation from the initial planning stages until the announcement of the results at the symposium. According to Major Wayne Roe, chief of the RBS operations branch: "It takes an average of 20 people working an eight-hour shift at the site to complete the scoring of an aircraft. It's a 24-hour a day job at the sites to get the total job done."

The two trophies awarded to the Numbered Air Forces were split between Eighth and Fifteenth Air Forces this year. Eighth Air Force won the McDonnell-Douglas Trophy for the best KC-10 Tanker Unit while their counterparts took the Doolittle Trophy for the SAC NAF whose B-52 units achieved the highest percentage of possible points for low level bombing, low level time control and SRAM activity.

The 452 AREFW, the KC-135 Air Force Reserve unit from March AFB, can be especially proud. They won the "plum" for tanker units, the Saunders Trophy, for the KC-135 unit with the most points for all activity; the Navigation Trophy for the KC-135 unit with the most points in celestial navigation; and their crews, S-102 and S-101, placed second and third, respectively, for the Best KC-135 crew award. The winner of the Best KC-135 Crew Award went to Crew S-102 of Fairchild.

Another multiple trophy winner was the 7 BMW from Carswell AFB. B-52 crews from the Fort Worth base took the John D. Ryan Trophy for the B-52 unit with the most points for low level bombing including time control and the James F. Bartsch ECM Trophy for the B-52 unit achieving the most points for ECM.

Tornado crews from RAF Marham certainly made their presence felt. For the second straight year the RAF won the John C. Meyer Trophy for the F/FB-111/Tornado unit with the highest damage expectancy rating. In fact, RAF units 2 and 1 placed first and second, respectively. The British crews also took the top two positions for the Curtis E. LeMay Bombing Trophy. This trophy, awarded to B-52/F/FB-111/Tornado crew with the most points in high and low level bombing

and time control, went to Crew 01 of RAF 1 and second place to Crew 03 of RAF 2. Crew 04 of RAF 2 won the Best Tornado Crew Award.

The 319 BMW won the SRAM Trophy and the Most Improved Unit Award. The Russell E. Dougherty SRAM Trophy goes to the B-52 or FB-111 unit with the most points for SRAM operations. Grand Forks AFB's second award, the General B. L. Davis Most Improved Unit Award, is presented to the most improved unit based on a comparison of the current year's results versus the previous year's competition.

The William J. Crumm Linebacker Memorial Trophy went to the 416 BMW of Griffiss for achieving the most points for high altitude bombing and time control for a B-52 unit.

The guest speaker at the symposium banquet was Ambassador John G. Tower, the former U.S. Senator from Texas. Ambassador Tower, who is the Chief Ne-

Cont'd on page 26

The Best Crew Awards were won by the following crews and units:

Best B-52, First, Crew E-33: P Capt Robert B. Bush, CP 1Lt Jeffrey K. Beene, RN Maj Philip C. Krasnicki, N 1Lt Michael J. Oar, EW 1Lt Ronald C. Smith, AG TSgt Scott T. Smith, 5th Bomb Wing, Minot AFB.

Second, Crew S-20, commanded by Capt John G. Prunty, 7 BMW, Carswell AFB.

Best FB-111, First, Crew S-04: P Maj Gregory M. Shaka, RN Capt Steven R. Winegarden, 509 BMW, Pease AFB.

Second, Crew S-02: P Capt Bruce J. Kennedy, RN Maj James R. Hobbs, 509 BMW, Pease AFB.

Best TAC F-111, First, Crew R-27: P Capt Paul L. Stone, WSO Capt Richard J. Bartell, 27 TFW, Cannon AFB.

Best RAF Tornado, First, Crew 04: P Sq Ldr J. D. Walmsley, N Sq Ldr J. Stone, RAF Marham UK.

Best KC-10, First, Crew E-232: P Capt Derrick B. Spott, CP Capt Robert P. Hendrickson, FE TSgt John Sokol, BO Sgt Scott Rhoads, 32 AREFS, Barksdale AFB.

Second, Crew E-202, commanded by Maj Douglas Koch, 79 AREFS, March AFB.

Best KC-135, First, Crew S-102: P Maj Samuel L. Grier, JR., CP 1Lt Paul L. Meyers, N Capt Stanley J. Dougherty, BO Sgt Robert E. McDonald, 92 BMW, Fairchild AFB.

Second, Crew S-102, commanded by Maj Salvatore J. Mercurio, III, 452 ARW, March AFB.



PROFESSIONAL PERFORMERS

Missile Maintenance

AIC Joseph P. Spillane, 321st SMW, Grand Forks AFB, is SAC's Missile Maintenance Airman of the Month. Assigned to the electro-mechanical team section, AIC Spillane has distinguished himself through recognition for his excellent maintenance support of the missile weapon system. During a recent SAC IG visit, he received a 100% pass rate for his codes test and went on to be named a "professional performer" for his outstanding maintenance support during that ORI. AIC

Spillane earned the 321st Maintenance Team of the Day honors on four separate occasions by repairing a non-mission capable launch control center (LCC) power system and identifying and correcting three major hardness discrepancies. He also performed a successful nondestructive manipulation of a launch facility (LF) entry system. AIC Spillane's personal effort and integrity, during proficiency evaluations by 3901st SMES, helped lead his section to an excellent pass rate. His two highly qualified evaluation ratings directly contributed to the wing's highest personnel proficiency rating ever achieved.

Munitions Maintenance

Sgt Mark Zigler, 5 BMW, Minot AFB, is SAC Munitions Maintenance Airman of the Month.

Sgt Zigler is clearly a superior performer whose initiative, self-motivation and ability to accomplish any assignment place him at the front of his contemporaries. He is unsurpassed in loading skill and knowledge. His training prowess enabled the loading section to achieve 100 percent passing on all evaluations for the past two consecutive SAC MSET inspections. Sgt Zigler's team chief abilities always surface when exceptional loading skills are required. He received a letter of appreciation

for a munitions upload demonstration for the Secretary of the Air Force, and he was selected by his supervisors to lead in SAC weapons loading competitions in 1983 and 1984. He was evaluated four times by MSET during these competitions and made no errors. More recently during the June '85 Global Shield generation, his load crew completed nine separate line actions which accounted for 35 percent of all loading operations. His crew completed the generation phase 11 hours ahead of established time requirements. This degree of performance normally requires two separate load crews. Because of his technical competence and leadership ability, Sgt Zigler has also been selected as the 5 MMS loading standardization team chief.

Aircraft Maintenance

Sgt David J. Natishak, 380 BMW, Plattsburgh AFB, is SAC's Maintenance Airman of the Month. Currently serving as a quality assurance inspector/evaluator, Sgt Natishak is responsible for evaluating technical inspections on 31 KC-135 A/Q model aircraft and as-

sociated equipment to determine quality of maintenance performed and compliance with technical data. He also performs personnel evaluations on 120 technicians and supervisors to determine job proficiency and degree of training. During the past year, Sgt Natishak's dedication to improvement was reflected when SAC MSET judged the aircraft technical inspections for

AIC Joseph P. Spillane



SSgt Mark Zigler



SSgt David J. Natishak



areas evaluated by him to be "high excellent."

Sgt Natishak's expertise and ability to effectively communicate were also demonstrated while performing as a KC-135 and FB-111 EWO generation monitor during a recent SAC ORI. He performed superbly by providing wing battle staff with prompt and accurate status inputs, accelerating the decision making process. This resulted in an "outstanding" rating for statistics with all aircraft generated on time or early.

Sgt Natishak accepted the challenge and added responsibility as the contract quality assurance evaluator (QAE) for a \$250,000 transient services contract. He is a vital member of the contracting team ensuring the contractual rights of the government are protected and that the government is receiving quality services for its contracting dollars. As a dedicated and conscientious QAE, Sgt Natishak performs superbly in this most difficult job.

Missile Crew

Crew R-123, consisting of 1Lt James H. Spear, MCCC, and 2Lt George A. Crawford, DMCCC, 90 SMW, F E Warren AFB, is SAC's Missile Crew of the Month.

While on strategic alert recently, Crew R-123 took quick and decisive actions to avert possible loss of life and equipment damage. While coordinating with an explosive disposal team and processing a canine drug detection team into the LCC, the crew detected a strong gas odor in the tunnel junction area. The crew immediately recognized the danger of fire and explosion, and

took action to manually harden the LCC to protect it. The sump pump LCC blast door was also found to be inoperative due to shorted and submerged high voltage cables. The crew took action to eliminate the shock hazard and notified the proper agencies to eliminate the hazard. Crew R-123 demonstrated a keen ability to sense a potentially dangerous situation and react quickly and correctly. Their comprehensive understanding of LCC equipment and decisive actions avoided possible personnel injury and serious equipment damage. These skills clearly mark them as superior missile combat crew members and Air Force officers.

Heads Up Flying Club

Captain Bruce Jinneman, 17 RW, was recently flying a TR-1 back to RAF Alconbury from his first operational USAFE mission. He had already been airborne more than eight hours when his sump gauge gave a low fuel indication. Captain Jinneman's first suspicion was that the gauge was faulty, as totalizer indications verified ample fuel supply. However, efforts to transfer fuel into the sump were unsuccessful and the only logical conclusion was a trapped fuel supply.

Captain Jinneman was still a considerable distance from RAF Alconbury when he realized he only had fuel for another 10 minutes of flight. He immediately set up a maximum range descent profile, and mentally prepared for what was to follow.

Eight plus hours confined to one seat in a cramped environment wearing a full pressure suit is a trying ex-

perience where even normal physical activity is tiring; so when Captain Jinneman's engine suddenly flamed out, he was well on his way to exhaustion. At that point he had two major options: glide the aircraft to a suitable airfield and attempt a dead stick landing, or guide the aircraft to a safe area and eject. His decision was to try to bring the aircraft and its equipment back safely as the option to eject could be exercised at almost any time up to landing.

The supervisor of flying, Maj Bill Walker, assisted in recovery of the aircraft. He gave the weather report to the pilot — a broken deck of clouds at 5000 feet and just enough wind to make it sporting.

By now Captain Jinneman was approaching RAF Alconbury and had sufficient altitude to descend through the broken deck overhead and position himself for the engine out pattern. With Major Walker conducting chase operations, the TR-1 was brought to an otherwise uneventful dead stick landing.

Captain Jinneman performed admirably throughout the emergency. He saved a very valuable aircraft from total destruction, and his cool head prevented a disaster at an undetermined crash site. Superior airmanship by this dedicated professional has earned Captain Jinneman a greatly deserved Well Done!

1Lt James H. Spear

2Lt George A. Crawford



Capt Bruce Jinneman



BOMB COMP '85

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gotiator of the U.S. Strategic Arms Reduction Talks Negotiation Team, reflected on the START negotiations with the Soviet Union. "Numerically we are outnumbered, technologically we are ahead, for now, but we have an added dimension, giving us the advantage — the crew member in the cockpit." All of you who competed in this year's BOMB COMP are the finest example of that dimension. **Congratulations!**

Best TAC F-111 Crew, 27 TFB, Cannon AFB.



Best RAF Tornado Crew, RAF 2, Marham.



Best KC-135 Crew, 92 BMW, Fairchild AFB.



Best KC-10 Crew, 2 BMW, Barksdale AFB.



SAC

SAFETY

SCREEN



The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system IAW AFR 127-2/SS1.

310 AREFS, Plattsburgh Crew R-165: P Capt Edward M Breen, CP 2Lt Alfred E Jones, N 1Lt Mark K Weiser, BO A1C John P Navarro

924 AREFS, Castle Crew R-108: P Capt Lance Kaplan, CP Capt Paul A Nelson, N 1Lt Clifford M Roth, BO TSgt Donald J Rundle

917 AREFS, Dyess Crew R-130: P Capt Barry C Bogart, CP 1Lt Gregg A Burden, IN 1Lt Mark J Van Kooten, BO A1C Billie J Black Jr

22 AREFS, March Crew R-112: FP Maj Randolph A Albright, CP 1Lt Scott L Bubier, NN 1Lt Delores K Smith, BO SSgt Michael A Aldapa

22 AREFS, March Crew R-114: FP Capt Mark K Reinke, CP Capt Raymond J White, NN 1Lt Douglas H Fehrmann, BO SSgt Chester S Robbins Jr

128 AREFG, Gen Mitchell Fld, Milwaukee: IP Maj Chuck Hardesty Jr, CP 1Lt Pat Cowle, N Capt Mike Leahan, BO MSgt Ray Bazen

38 SRS, Offutt Crew R-09: IP Maj Barry Olshaw, CP Capt Jeff Robertson, N1 Capt Keith Stachowski, N2 1Lt Charles Cooper

380 AREFS, Plattsburgh Crew E-112: P Capt Gary P Thaller, CP 1Lt Thomas D Makowski, N 1Lt Steven M Petr, BO Sgt Lynn E Sturgill

9 AREFS, March Crew: P Capt Thomas D Trainor, CP Capt David A Razo, FE MSgt James S Grimm, BO MSgt David L Kirkland

9 AREFS, March Crew: P Capt David L Shields, CP 2Lt Michael D Ethridge, FE SSgt William S Chin, BO TSgt James M Mountcastle

384 AREFS, McConnell Crew E-158: IP Capt Clyde T Anderson, CP 1Lt Michael L Ladaw, N 1Lt Roger R Perret, BO Sgt Michael J Perry

20 BMS, Carswell Crew R-36: AC Maj Lawrence R Nilssen, CP 1Lt William R Richards, RN Capt Steven R Hess, N 1Lt Robin L Damita, EW 1Lt Ward W Severts, G Sgt Jay R Reznecheck

91 AREFS, McConnell Crew E-111: P Capt Peter M Wilson, CP 1Lt Richard A Taylor, N 1Lt David C Ham, BO Sgt Henry E Wayne

91 SMW, Minot Crew R-144: MCCC 1Lt Douglas J Harvey, DMCCC 2Lt Keith R Gelinas

91 SMW, Minot Crew E-071: MCCC Capt David A Hall, DMCCC Capt James L Field

308 SMW, Little Rock Crew E-111: MCCC Capt Nancy K Dean, DMCCC 1Lt Johnny M Nail, MFT Sgt Kirk W Hemphill, MSAT SrA Steven T Dunn

321 SMW, Grand Forks Crew R-013: MCCC Capt William R McCullough, DMCCC Capt Dale E Carman

321 SMW, Grand Forks Crew R-153: MCCC 1Lt Robert J Palmer, DMCCC 2Lt Charles H Ryan

351 SMW, Whiteman Crew E-043: MCCC 1Lt John J Mullee, DMCCC 2Lt Theodore K Scholz



HALL OF FAME

OVER TWENTY-NINE YEARS	
170 AREFG, McGuire (NJANG).....	Feb. '56
OVER TWENTY-SEVEN YEARS	
171 AREFW, Greater Pittsburgh (PAANG).....	Mar. '58
157 AREFG, Pease (NHANG).....	Jun '58
OVER TWENTY-SIX YEARS	
940 AREFG, Mather (USAFR).....	May '59
OVER TWENTY-FOUR YEARS	
151 AREFG, Salt Lake City (UTANG).....	Feb. '61
134 AREFG, McGhee Tyson (TNANG).....	Aug. '61
OVER TWENTY-THREE YEARS	
11 SG, Fairford.....	Feb. '62
340 AREFG, Altus.....	Jun '62
96 BMW, Dyess.....	Aug. '62
OVER TWENTY-ONE YEARS	
160 AREFG, Rickenbacker (OHANG).....	Dec. '64
OVER TWENTY YEARS	
320 BMW, Mather.....	Jul '65
OVER NINETEEN YEARS	
452 AREFW, March (USAFR).....	Sept '66
OVER EIGHTEEN YEARS	
55 SRW, Offutt.....	Jul '67
2 BMW, Barksdale.....	Aug '67
OVER SIXTEEN YEARS	
5 BMW, Minot.....	Feb. '69
141 AREFW, Fairchild (WAANG).....	Oct '69
OVER FIFTEEN YEARS	
28 BMW, Ellsworth.....	May '70
OVER THIRTEEN YEARS	
101 AREFW, Bangor (MEANG).....	Mar '72
306 SW, Mildenhall.....	Apr '72
416 BMW, Griffiss.....	May '72
305 AREFW, Grissom.....	Aug '72
OVER TWELVE YEARS	
379 BMW, Wurtsmith.....	Apr '73
OVER ELEVEN YEARS	
931 AREFG, Grissom (USAFR).....	Feb '74
384 AREFW, McConnell.....	Mar '74
189 AREFG, Little Rock (ARANG).....	May '74
43 SW, Andersen.....	Dec '74
OVER TEN YEARS	
68 AREFG, Seymour Johnson.....	Sep '75
OVER EIGHT YEARS	
410 BMW, K.I. Sawyer.....	Apr '77
190 AREFG, Forbes (KSANG).....	Apr '77
128 AREFG, Milwaukee (WIANG).....	Jul '77
OVER SIX YEARS	
376 SW, Kadena.....	Aug '79
OVER FIVE YEARS	
7 BMW, Carswell.....	Jul '80
319 BMW, Grand Forks.....	Sept '80
380 BMW, Plattsburgh.....	Oct '80
OVER FOUR YEARS	
97 BMW, Blytheville.....	Jan '81
22 AREFW, March.....	Oct '81
ICBM	
OVER TWENTYONE YEARS	
1 STRAD, Vandenberg.....	Sept '64
OVER THIRTEEN YEARS	
321 SMW, Grand Forks.....	Aug '72
OVER ELEVEN YEARS	
351 SMW, Whiteman.....	Oct '74
91 SMW, Minot.....	Nov '74
OVER SEVEN YEARS	
381 SMW, McConnell.....	Aug '78
44 SMW, Ellsworth.....	Nov '78
OVER SIX YEARS	
90 SMW, F.E. Warren.....	Dec '79
OVER FIVE YEARS	
308 SMW, Little Rock.....	Sept '80
To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.	